

## Predicting the Last Irrigation for Corn, Milo and Soybeans

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One thing irrigators must start thinking about around the first week of August is when to shut down the irrigation system for the season. Ideally, you will want to stop irrigating far enough ahead of maturity so the crop will extract as much moisture from the soil as possible without hurting yield. This makes maximum use of the moisture present in the root zone, minimizes the amount of water pumped (which saves expense) and gives you the driest possible soil at harvest time, which minimizes soil compaction and harvest problems.

Research has shown a **medium-season corn** at the beginning dent stage of growth, will take approximately four weeks time and will require an additional 5.3 inches of water to reach physiological maturity (black layer). At the full dent stage, it will take about two weeks to reach maturity and will require about 2.5 inches of water.

**Grain Sorghum** requires about five inches of water to reach maturity from the soft-dough stage, and two inches of water from the hard-dough stage of growth.

**Soybeans** require about 6.5 inches from the beginning seed fill stage or 3.5 inches from the full seed fill stage to reach maturity. (Check the seed fill stage by examining the development of seeds in the pods at one of the four uppermost nodes on the main stem that has fully developed leaves. The beginning seed fill stage is when bean seeds can be detected by squeezing with the fingers in one of the pods. The full seed fill stage is when one of the pods contain full-sized bean seeds.)

An alternative way to

figure when to stop irrigating would be to figure out on what day a full soil profile would carry the crop through to maturity. The silty clay to silty clay loam soils in southeast Nebraska hold 1.6 to 1.8 inches of available water per foot of soil, respectively. If we assume we have a four foot root zone, we have about seven inches total available water holding capacity in the root zone. Research has shown that 60 percent of the available moisture in the root zone can be depleted at crop maturity without reducing grain yield. We can utilize about 4.2 inches of the available moisture without hurting yield.

Having discussed the above, we can now predict the day when a full profile on a silty clay soil would carry the various crops through to maturity. For a medium-season corn, the target date would be when half of the corn kernels have dented. For grain sorghum, it would occur about one week after the soft-dough stage. For soybeans, it would be at, or just before the full seed fill stage.

Remember, these guidelines assume you started with a four foot soil profile at field capacity on the target date. If the profile was not filled to capacity (most likely it won't be), you will need to continue to irrigate until you have applied enough water to have filled the profile. For example, if the soil would have held another 2.5 inches on the target date, it will take a total of 2.5 inches of rainfall plus irrigation, in addition to the available soil moisture to finish out the crop.

Predicting the date of the last irrigation is an important water management decision. You can minimize expense and leave your soil in good shape for harvest without harming yields by following these simple guidelines.

## Effect of Increasing Energy Prices on Irrigation Costs

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**Question:** Diesel prices have increased from about \$1.65 in June 2005 to \$2.45 as this is being written. What effect will this have on the cost of pumping irrigation water?

**Answer:** The cost to pump water depends on the

total head the pump must produce to deliver the water and the volume of water pumped. The total head has two components. The lift component is the distance the pump must lift the water from the water level in the well to the pump discharge. The second component of head is the system pressure, measured at the pump. The

greater the head produced, the greater the cost per acre-inch of water delivered. The greater the volume of water pumped (acre-inches<sup>1</sup>), the greater the cost per acre. The table below presents several scenarios that represents the effect the increased cost of diesel has had on typical irrigation situations in Nebraska.

### Increased irrigation fuel cost for an \$0.80 per gallon increase in diesel price<sup>2</sup>

Irrigation System	Typical of location in Nebraska	Lift, feet	Pressure, PSI	Application Depth, inches	Fuel Cost per acre at \$1.65/gal	Fuel Cost per acre at \$2.45/gal	Increased fuel cost \$/acre
Pivot	Eastern	125	35	12	\$37.05	\$55.02	\$17.97
Pivot	Northeast	150	40	12	\$43.63	\$64.79	\$21.16
Pivot	Northeast	150	65	12	\$54.03	\$80.23	\$26.20
Pivot	Central	150	40	16	\$58.18	\$86.40	\$28.22
Pivot	Western	175	40	18	\$72.20	\$107.22	\$35.02
Gated Pipe	Eastern	125	10	15	\$33.32	\$49.48	\$16.16
Gated Pipe	Central	150	10	20	\$52.93	\$78.60	\$25.67
Gated Pipe	Platte Valley	40	10	22	\$20.82	\$30.92	\$10.10
Gated Pipe	Western	150	10	22	\$57.12	\$84.82	\$27.70

<sup>1</sup> Acre-inch is the volume of water needed to cover an acre one-inch deep or 27,154 gallons.

<sup>2</sup> Irrigation costs were calculated using Irrigcost, an Excel worksheet written by Thomas Dorn, Extension Educator, UNL which assumes the pumping plant is operating at the Nebraska Pumping Plant Performance Criteria. Irrigcost is available for download at no cost on the Web at <http://lanaster.unl.edu/ag/crops/irrigate.htm>

## Fall is the Best Time to Stop Henbit

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Henbit is a biennial weed normally germinating in the early fall but may germinate in early spring, depending on moisture conditions. It grows in an upright position, seldom reaching heights greater than 12 inches. Typical of plants in the mint family, the upper stems are square. The 1/2- to 1-inch leaves are opposite, dark green and hairy above and lighter below. The lower leaves have petioles but the upper leaves are borne directly on the stem. The leaves are triangular to circular and have veins radiating out from a central point. The leaf edges have rounded teeth and are crinkled.

Pink to lavender to purple flowers are borne in whorls at the top of the plant in April and May. Usually, in Nebraska, the plants go to seed and die by mid June.

### Chemical Control

Henbit is most effectively



Larry Altein @ USDA-NRCS PLANTS Database

controlled in the fall. In the lawn, the same pre-emergent chemicals used for crabgrass control will do a good job of controlling henbit. As when applying products for pre-emergent crabgrass control, the chemical application must precede henbit germination to be effective. Apply the first pre-emergent treatment around the first of September followed by a second application of pre-emergent herbicide a month later or follow up with

a post-emergent application at the end of October. There are no pre-emergent chemicals registered for use in pastures.

Post-emergent control can be achieved with products containing 2,4-D mixed with dicamba, and/or MCPP in late-October followed by a second application, if necessary, in March.

If Henbit was a problem in crop fields, the seed supply will be there to start the cycle again this fall. In crop fields, apply 2,4-D (1 quart), Basis + 2,4-D (0.5 oz + 1 pint), Glyphosate (2 quart), Glyphosate + 2,4-D (1.5 pint + 1 pint), or Gamzone Max (1.3 pint) in late fall after harvest.

You can achieve fair control in the spring with 2,4-D (1 pint) or 2,4-D + Dicamba (1 pint + 0.5 pint). Better control is achieved in the spring with atrazine in combination with 2,4-D or Dicamba but the field cannot be planted to atrazine-sensitive crops. See UNL Extension publication (EC 130) "2006 Guide for Weed Management," page 41.

## Pesticide Container Recycling Program

University of Nebraska-Lincoln Extension coordinates a recycling program for plastic agricultural pesticide containers. Containers may be brought to the UNL Extension in Lancaster County office, 444 Cherrycreek Road, Lincoln, during business hours 8 a.m. to 4:30 p.m. Monday-Friday, EXCEPT for the weeks of July 24 and July

31. Please call ahead at 441-7180 to ensure someone will be available to inspect and accept the containers before you come.

**A collection will also be held at the Farmers Cooperative Company in Bennet on Friday, Aug. 4 from 9 a.m. until noon.** All containers must be inspected to make sure that they have

been properly rinsed, with the caps and labels removed before they can be placed in our trailer. (Paper labels one layer thick may remain on the containers.) We will accept all sizes of agricultural pesticide containers, including 30 gallon plastic drums. Yard and garden pesticide containers are brown and cannot be recycled with the white and

yellow containers.

Other containers, (bleach, antifreeze, oil etc.) will not be accepted in this program which is paid for by the Agricultural Chemical Manufacturing Association, but domestic plastic containers can be recycled at several locations around Lincoln.

Recycled pesticide



containers do not enter the general plastics industry. The material is currently being recycled into plastic posts, industrial pallets, field drain tiles, speed bumps, railroad ties and parking lot tire stops.